Computations of Price Sensitivities After a Financial Market Crash

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Abstract

Several new approaches have been recently suggested in the literature for the computation of the price sensitivities of financial assets. However, there is lack of studies that investigate this issue during financial crises. It is a well-known fact that the volatility increases significantly during financial crises. This increased volatility is naturally going to affect the underlying option pricing, the price sensitivities and consequently the management of the underlying risk. It is

especially during the crises that the investors require to have access to precise calculations in order to deal with the increased level of risk. This issue is especially relevant due to the globalization. Thus, to compute the price sensitivities in such a scenario is crucial. This paper is the first attempt to the best knowledge to address the computation of price sensitivities after a financial market crash occurs. Our method to tackle the problem is based on Malliavin calculus.

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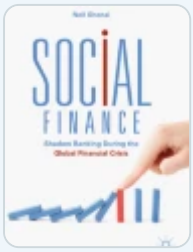

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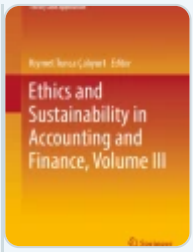

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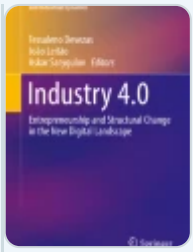

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References

1 Black F, Scholes M (1973) The pricing of options and corporate liabilities. J Polit Econ 81:637–654

2 Deeba E, Dibeh G, Xie S (2002) An algorithm for solving bond pricing problem. Appl Math Comput 128(1):81–94

3 Baillie RT, Dibeh G, Chahda G (2005) Option pricing in markets with noisy cyclical and crash dynamics. Finance Lett 3(2):25–32

4 Dibeh G, Harmanani HM (2007) Option pricing during post-crash relaxation times. Phys A 380:357–365

5 El-Khatib Y, Hatemi-JA (2011a) On the price sensitivities during financial crisis. In: Proceedings of the world congress on engineering 2011. Lecture notes in engineering and computer science, WCE 2011, London, U.K., 6–8 July 2011, pp 401–404

6 El-Khatib Y, Hatemi-JA (2011b) On the calculation of price sensitivities with jump-diffusion structure. MPRA Paper 30596. University Library of Munich, Germany

7 El-Khatib Y, Privault N (2004) Computations of greeks in a market with jumps via the Malliavin calculus. Finance Stoch 8(2):161–179

8 Forbes KJ, Rigobon R (2002) No contagion, only interdependence: measuring stock market co-movements. J Finance 57:2223–2261

9 Fournié E, Lasry JM, Lebuchoux J, Lions PL, Touzi N (1999) Applications of Malliavin calculus to Monte Carlo methods in finance. Finance Stoch 3(4):391–412

10 Hatemi-J A, Hacker S (2005) An alternative method to test for contagion with an application to the Asian financial crisis. Appl Financ Econ Lett 1(6):343–347

11 Lillo F, Mantenga F (2003) Power-law relaxation in a complex system: Omori law after a financial market crash. Phys Rev E 016119

12 McCauley J (2004) The dynamics of markets: econophysics and finance. Cambridge University Press, Cambridge

13 Nualart D (1995) The Malliavin calculus and related topics. Springer, Berlin

14 Oksendal B (1996) An introduction to malliavin calculus with applications to economics. Working paper 3, Institute of finance and management science, Norwegian school of economics and business administration

15 Savit R (1989) Nonlinearities and chaotic effects in options prices. J Futures Mark 9(6):507–518

16 Sornette D (2003) Why stock markets crash: critical events in complex financial markets. Princeton University Press, Princeton, NJ

17 Tvedt J (1998) Valuation of European futures options in the bifex market. J Futures Mark 18:167–175

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